Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

A281.9
Ag83E
Cop. 2

ERS-478

PRODUCTION COSTS, RESOURCE RETURNS, AND OTHER ECONOMIC CHARACTERISTICS-COMMERCIAL COTTON FARMS, SOUTHERN HIGH PLAINS, TEXAS, 1966-69

U. S. DEPT. OF AGRICULTURE
NATIONAL AGRICULTURAL LIBRARY
RECEIVED
SEP 6 1972
PROCUREMENT SECTION
CURRENT SERIAL RECORDS

ECONOMIC RESEARCH SERVICE

U.S. DEPARTMENT OF AGRICULTURE

ABSTRACT

Estimated net incomes on typical cotton farms in the Southern High Plains of Texas during 1966-69 ranged from a high of $25,390 to a low of $6,430. The variations depended partly on whether the farm was irrigated, and on whether the operator was a full owner, a part owner, or a full tenant. With no charge for capital used in farm operations, and with operators assumed to be debt-free, net incomes were highest for full owners and lowest for full tenants in all years, and higher on nonirrigated than on irrigated farms except during 1967. When a 6-percent capital charge on the current value of assets was included as an opportunity cost, returns to full tenants were highest, with returns to part owners next. Inclusion of the 6-percent capital charge indicated that returns to capital invested in land were relatively lower than returns to operating capital or to operator labor and management.

Key Words: Commercial, cotton, farms, organization, cost and returns, resources, budgeting, comparative analysis.

PREFACE

Studies of costs and returns by type and size of farm have been published regularly by the U.S. Department of Agriculture for more than 30 years. This series has provided a measure of year-to-year change in farm costs and returns and a basis for evaluating the effect of changes in yields, prices, costs, Government farm programs, and other factors on farm returns. This publication provides similar information, but it is more comprehensive and analytical than most previous annual reports in the series.

Washington, D.C. 20250 July 1971

CONTENTS

	Page
SUMMARY	vi
INTRODUCTION	1
THE AREA AS A WHOLE	5
Underground water resources	5
Land use and type of farming	6
Land control methods	6
Farm size	6
SERIES STUDY FARMS	9
Major assumptions	9
Irrigated farms	9
Nonirrigated farms	12
COMPARATIVE RETURNS TO RESOURCES	14
Procedures in developing comparative returns	17
Returns from farming and comparative returns	23
CONCLUSION	24
LITERATURE CITED	24

FIGURES

Figure		Page
1.	Mill consumption of fibers, per capita	4
2.	Cotton production, use and carryover	4
3.	Study area, Southern High Plains, Texas	5

TABLES

Table		Page
1.	Farms reporting cotton, number of bales produced, and shares of total, by size group, by States and United States, 1964	2
2.	Cotton acreage planted and harvested, and cotton production, by States and United States, 1964 and 1967-69	3
3.	Percentage distribution of all farm operators by tenure and cotton farm operations by tenure and gross farm income, U.S. Census of Agriculture subregion 84 and subareas 1 and 2, Southern High Plains, 1959 and 1964	7
4.	Percentage distribution of all farms by value of farm products sold, Southern High Plains study area and subareas 1 and 2, 1959 and 1964	8

TABLES--Continued

Table		Page
5.	Irrigated 935-acre cotton farms: Organization, yields per acre, costs and returns, full-owner, part-owner, and share-tenant operators, subarea 1, Southern High Plains, 1966-69...	10
6.	Nonirrigated 935-acre cotton farms: Organization, yields per acre, costs and returns, full-owner, part-owner, and share-tenant operators, subarea 2, Southern High Plains, 1966-69...	13
7.	Number of cotton farmers reporting debt, and amount of debt per acre, by farm type and tenure, subareas 1 and 2, Southern High Plains, 1968.....	15
8.	Distribution of cotton farmers reporting debt by ratio of total debts to total value of assets, by farm type and tenure, subareas 1 and 2, Southern High Plains, 1968.....	16
9.	Operator equity in farm physical assets, January 1, 1968, and comparative returns to resources under Stockholder and Landlord standards, 935-acre irrigated and nonirrigated cotton farms, by tenure, Southern High Plains, Texas, 1968.....	18
10.	Operator equity in farm physical assets, January 1, 1968, and comparative returns to resources under Stockholder and Landlord standards, 935-acre irrigated and nonirrigated cotton farms, by tenure, Southern High Plains, Texas, average 1966-68.....	20

SUMMARY

Estimated net incomes on typical cotton farms in the Southern High Plains during 1966-69 ranged from a high of $25,390 to a low of $6,430. Net incomes were estimated for irrigated and nonirrigated 935-acre farms (the average size of the farms surveyed) operated by full owners, part owners, and full tenants. With no charge for capital used in farm operations, and with operators assumed to be debt-free, net farm incomes on irrigated and nonirrigated farms were highest in all years for full owners and lowest for full tenants. Net returns on nonirrigated farms were above those on irrigated farms except during 1967. Dryland farming conditions were particularly good in 1966 and 1968.

Inclusion of a 6-percent capital charge on the current value of assets as an opportunity cost drastically changed the magnitude and order of net income estimates for the depicted tenure types. Adjusted net farm incomes decreased as the proportions of land operated through ownership increased, and were negative for the full owner of an irrigated farm in all 4 years, suggesting relatively low rates of return on investments in irrigated land.

Net returns to part-owner and full-tenant operators were compared with returns to similar resources in nonfarm use during 1966-68. A part-owner operator of an irrigated farm, with its large capital requirements, could have obtained a greater total return with a similar amount of capital invested in common stocks and his labor employed at industrial wage rates. The part-owner operator of a nonirrigated farm, however, received a higher total return to resources than he could have obtained as a stockholder. The full-tenant operator of a nonirrigated farm received a much higher return, primarily for his labor and management, than he could have received with his capital invested in common stocks and his labor employed at industrial wage rates. The comparative attractiveness of nonfarm investment in common stocks increased as the investment in land increased.

Net rental incomes received by debt-free landlords plus returns to similar family labor employed at industrial wage rates were compared with income earned by farmers. On irrigated and nonirrigated farms, both part-owner and full-tenant operators earned net incomes significantly in excess of those received by landlords with identical farm equities. Differences between operator and landlord incomes were greatest on nonirrigated farms. Irrespective of tenure or type of farming, landlords received a less attractive return to resources than stockholders during 1966-68.

PRODUCTION COSTS, RESOURCE RETURNS, AND OTHER ECONOMIC CHARACTERISTICS--COMMERCIAL COTTON FARMS, SOUTHERN HIGH PLAINS, TEXAS, 1966-69

By

J. Albert Evans and W.F. Hughes 1/

INTRODUCTION

Cotton is produced on approximately one-half million farms in the United States. For many farmers, cotton production is their major enterprise. More than 99 percent of all cotton grown in the United States is upland cotton. The 1964 distribution of cotton farms and cotton production by acreage harvested is given in table 1 as reported for States and the United States by the Census of Agriculture.

In recent years, prices paid for production inputs and services have been rising. By expanding sizes of farms and adopting improved technology, cotton farmers have offset part of these higher costs. But at the same time prices received for cotton generally have declined, and Government programs, especially during 1966-68, tended to hold down cotton production (table 2). Variable weather also has affected the volume of production on cotton farms. To guide future policy decisions, the research reported here was initiated to measure the effects of these changes on irrigated and nonirrigated commercial cotton farms in the High Plains of Texas where approximately 11 percent of U.S. cotton is normally produced (fig. 1). Furthermore, the analysis indicates the effects of price, program, and weather variables on farms operated by full owners, part owners, and full tenants, and for the latter two tenure types, compares net farm returns with returns to similar resources employed or invested in nonfarm occupations and businesses.

Annual consumption of cotton has remained fairly constant over the past 10 years, but the proportion of cotton in the growing fiber market has declined under the impact of strong competition from manmade fibers. Cotton constituted 65 percent of the 6.5 billion pounds of fiber consumed by U.S. mills in 1960, whereas it constituted only 40 percent of the 10 billion pounds of fiber consumed in 1969 (4).2/ The increased manufacture of blended and 100-percent manmade fiber fabrics (figs. 2 and 3) is reducing the ability of U.S. cotton to provide competitive returns to the resources used in cotton production.

1/ Agricultural Economists, Farm Production Economics Division, Economic Research Service, Washington, D.C., and College Station, Tex., respectively.

2/ Underscored numbers in parentheses refer to Literature Cited, p.24.

Table 1.--Farms reporting cotton, number of bales produced, and shares of total, by size group, by States and United States, 1964

State	Total cotton farms	Total cotton production	Acres of cotton harvested per farm									
			Less than 50 acres		50-99 acres		100-299 acres		300-499 acres		500 acres or more	
			Percentage of total farms	Percentage of total production	Percentage of total farms	Percentage of total production	Percentage of total farms	Percentage of total production	Percentage of total farms	Percentage of total production	Percentage of total farms	Percentage of total production
	1,000 farms	1,000 bales	Percent									
Missouri	7.1	399	69.1	27	18.2	26	11.5	36	.9	7	.3	4
North Carolina	29.6	370	96.5	65	2.1	12	1.1	15	.2	6	.1	2
Tennessee	27.5	641	93.7	64	4.1	16	2.0	17	.1	2	.1	1
South Carolina	25.9	554	92.3	46	4.3	15	3.0	27	.3	6	.1	6
Georgia	22.9	615	87.3	45	8.0	21	4.3	26	.3	5	.1	3
Alabama	42.0	854	92.7	53	4.5	16	2.4	21	.3	7	.1	3
Mississippi	50.8	2,182	91.2	31	3.5	8	3.6	24	1.0	15	.7	22
Arkansas	21.7	1,536	72.3	20	13.2	15	11.3	33	2.1	15	1.1	17
Louisiana	16.2	571	86.8	33	6.3	14	5.7	32	.9	12	.3	9
Oklahoma	10.6	276	63.5	25	22.4	28	13.2	38	.8	7	.1	2
Texas	54.5	3,915	40.8	8	23.4	15	29.8	47	4.4	16	1.6	14
New Mexico	2.7	256	55.6	16	23.6	24	17.7	41	2.4	12	.7	7
Arizona	1.9	761	33.9	4	18.1	6	30.2	27	9.9	20	7.9	43
California	6.7	1,762	55.2	8	17.7	10	19.8	27	3.9	13	3.4	42
Other States	4.1	42	97.0	59	1.7	12	1.1	20	.1	2	.1	7
United States	324.2	14,734	79.2	24	9.6	14	9.2	32	1.4	13	.6	17

Source: 1964 U.S. Census of Agriculture, Bureau of the Census, Department of Commerce.

Table 2.--Cotton acreage planted and harvested, and cotton production, by States and United States, 1964 and 1967-69

State	Planted acres				Harvested acres				Number of 500-pound (gross weight) bales produced			
	1964	1967	1968	1969	1964	1967	1968	1969	1964	1967	1968	1969
	1,000 acres								1,000 bales			
Missouri	354	245	318	312	347	90	190	292	409	59	197	326
North Carolina	395	191	200	184	381	75	189	166	374	44	123	100
Tennessee	512	336	394	420	502	236	360	400	671	145	325	422
South Carolina	549	307	354	350	538	190	340	287	558	179	251	205
Georgia	646	335	410	410	632	267	395	385	617	228	266	282
Alabama	847	513	555	566	831	340	525	545	889	200	397	461
Mississippi	1,498	955	1,155	1,225	1,460	890	1,105	1,185	2,232	1,054	1,522	1,322
Arkansas	1,275	830	1,045	1,090	1,242	715	980	1,055	1,570	497	1,028	1,140
Louisiana	534	348	423	440	520	330	410	420	590	428	545	483
Oklahoma	614	425	421	500	575	370	380	465	287	194	264	279
Texas	6,225	3,960	4,450	5,175	5,675	3,525	4,125	4,675	4,122	2,767	3,525	2,862
New Mexico	194	132	161	163	185	122	151	146	257	157	176	157
Arizona	381	248	299	311	375	245	298	310	799	454	734	634
California	759	595	695	707	743	588	687	701	1,760	1,040	1,573	1,315
Other States 1/	53	28	32	29	51	14	25	26	45	12	22	21
United States	14,836	9,448	10,912	11,882	14,057	7,997	10,160	11,058	15,180	7,458	10,948	10,009
American-Egyptian cotton 2/	110	68	68	78	107	66	67	75	120	70	79	78

1/ Virginia, Florida, Illinois, Kentucky and Nevada.
2/ Included in State and United States totals.

Source: Crop production reports, Crop Reporting Board, Statistical Reporting Service, U.S. Department of Agriculture.

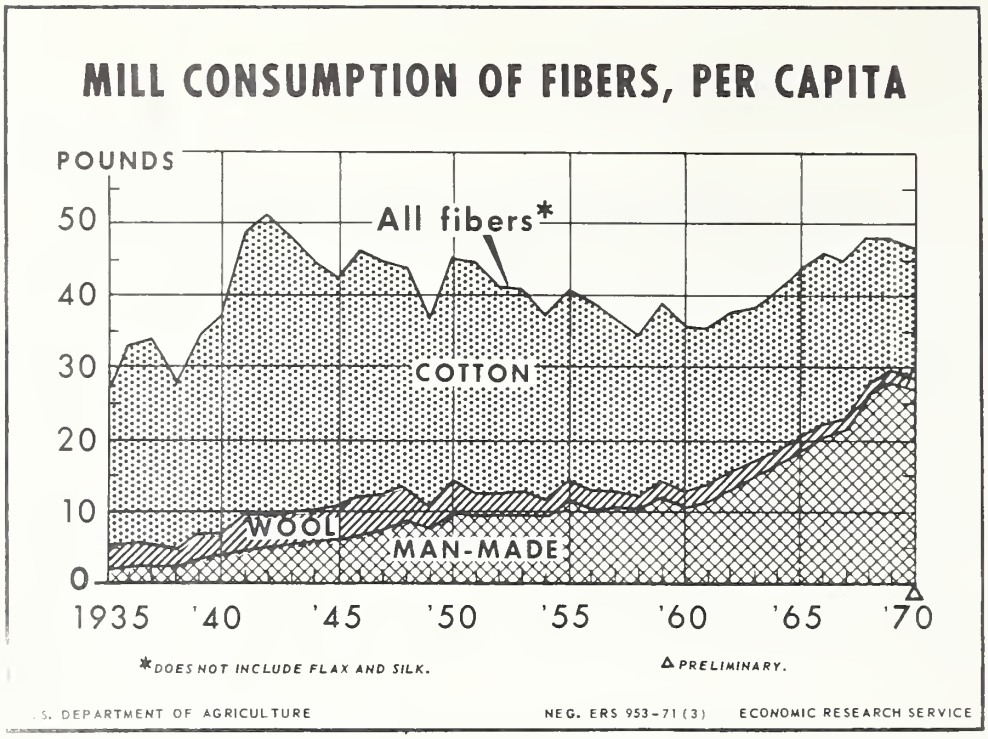

Figure 1

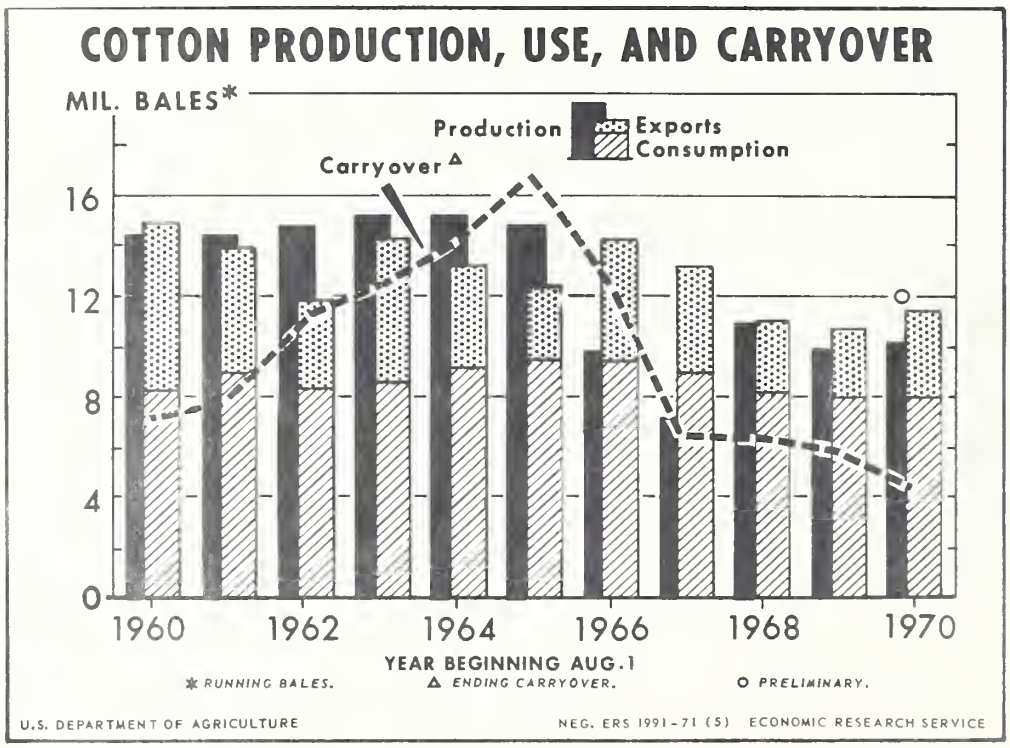

Figure 2

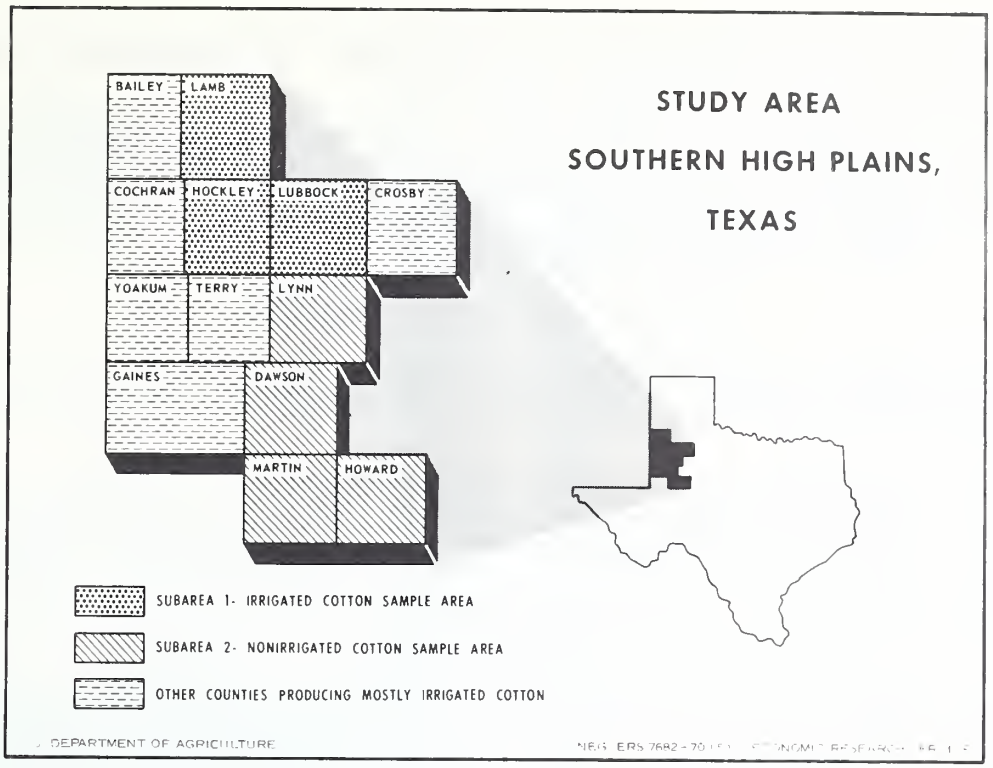

Figure 3

THE AREA AS A WHOLE

The Southern High Plains is a broad, sloping area, rising from about 2,700 feet above sea level in the southeast to over 4,000 feet along the Texas-New Mexico State line on the northwest. Soils of the study area are predominantly sandy, ranging from fine sandy loams to sandy loams in texture. Some of the lighter sandy soils are susceptible to severe wind erosion, making it difficult to establish and maintain crop stands. Physical characteristics promote large-scale mechanized farm operations.

The climate of the area is subhumid with warm to hot summers and open winters with high winds during the fall and spring. Rainfall ranges from an average of 15 inches on the west to around 20 inches on the east. About 75 percent of the annual precipitation occurs during the frost-free growing season.

The growing season, which averages 200 frost-free days in the North and 220 days in the extreme South, is minimal for successful cotton production. Because of the short growing season, the High Plains cotton crop is predominantly short staple, in contrast to most other cotton-producing areas of the United States.

Underground Water Resources

Underground water resources have contributed substantially, particularly since 1945, to agricultural output in the Southern High Plains. The Ogallala formation, the principal aquifer, underlies approximately 35,000 square miles of the Southern High Plains. Saturated parts of the

aquifer range in thickness from a feather edge to more than 300 feet in different parts of the Southern High Plains.

Limited recharge and overuse are depleting the underground water supply. The remaining economic life of water resources ranges from 5 to more than 50 years in specific hydrologic situations (2). These projections are based on the use of irrigation programs that maximize farm returns under 1966 cost-price conditions.

Land Use and Type of Farming

Two-thirds of the farmland is cropland. Crop sales, predominantly cotton and grain sorghum, account for four-fifths of the total value of farm products sold.

About 94 percent of all farms were classified as commercial and 89 percent of these received at least half of their gross cash receipts from sales of cotton lint and seed. Cotton occupied 55 percent of the harvested cropland and grain sorghum 38 percent, with 7 percent in "other crops." In 1968, 84 percent of all cotton acreage and 86 percent of all cotton production in subarea 1 (fig. 3) was irrigated; in subarea 2, 73 percent of the cotton acreage and 66 percent of cotton production was nonirrigated. Data from subareas 1 and 2 were used to assess irrigated and nonirrigated cotton production on the Southern High Plains. Irrigated cotton farms are defined as those on which all cotton is irrigated at least once, compared with nonirrigated cotton farms where no cotton is irrigated.

Land Control Methods

The analysis included measures of returns to farm operators who were (1) full owners, who hold title to their entire land base; (2) part owners, who own part and rent part of their land base; and (3) full tenants, who rent all the land they operate. The part-owner tenure group is increasing relative to other tenure groups on the Southern High Plains (table 3). The trend is especially apparent on the larger cotton farms--those grossing $20,000 or more annually.

Among the operators of large cotton farms, full ownership of the land base is much less common that it is among operators of small farms. In the irrigated and nonirrigated cotton study areas, full tenants outnumbered part owners and full owners in 1964. The distribution of farm operators by tenure method did not differ materially between the irrigated and nonirrigated cotton study areas. Approximately 80 percent of all full tenants were share tenants--that is, they operated under crop-share rental contracts wherein the landlord received 25 percent of the cotton and 33 percent of the grain sorghum produced. Landlords usually bore their proportionate share of fertilizer and ginning expenses and often paid a third of grain sorghum hauling cost.

Farm Size

The value of farm products sold differed widely among cotton farms in the Southern High Plains in 1964 when a severe drought sharply reduced production on nonirrigated farms (table 4). In 1959, a more normal year for which census data are available, 18 percent of the nonirrigated farms grossed under $10,000 compared with 13 percent of the irrigated farms. The percentage distribution among irrigated and nonirrigated farms grossing in the $10,000-$19,999 and $20,000 - $39,999 categories was highly

Table 3.--Percentage distribution of all farm operators by tenure and cotton farm operations by tenure and gross farm income, U.S. Census of Agriculture subregion 84 and subareas 1 and 2, Southern High Plains, 1959 and 1964

Class and year	Full owners	Part owners	Full tenants		
			All tenants	Share tenants	Other tenants
	Percentage of cotton farm operators				
Subregion 84 1/					
Cotton farms grossing $20,000-$39,999					
1959	19	31	50	42	8
1964	16	38	46	34	12
Cotton farms grossing $40,000 and over					
1959	11	49	40	33	7
1964	12	56	32	27	5
	Percentage of all farm operators				
Irrigated cotton subarea 1					
1959	30	27	43	33	10
1964	25	29	45	37	8
Nonirrigated cotton subarea 2					
1959	26	29	45	36	9
1964	23	37	39	32	7

1/ Includes Cochran, Yoakum, Gaines, Andrews, Winkler, Ector, Midland, and Crane counties, in addition to 13 counties shown in figure 3.

Source: 1964 U.S. Census of Agriculture, Bureau of the Census, Department of Commerce.

Table 4.--Percentage distribution of all farms by value of farm products sold, Southern High Plains study area and subareas 1 and 2, 1959 and 1964

Area and year	Less than $10,000	$10,000-$19,999	$20,000-$39,999	$40,000 or more
	Percent			
13-county area				
1959	15	25	33	27
1964 1/	25	25	29	21
Irrigated cotton subarea 1				
1959	13	28	34	25
1964 1/	18	26	33	23
Nonirrigated cotton subarea 2				
1959	18	27	33	22
1964 1/	44	25	20	11

1/ A severe drought in 1964 greatly reduced incomes of nonirrigating farmers.

Source: 1964 U.S. Census of Agriculture, Bureau of the Census, Department of Commerce.

similar in 1959. Average farm size has increased through the years and the decline in the number of farms suggests that further increases in average farm size can be expected. For this study, farms were classed in three size categories--under 600 acres of cropland, 600 to 1,200 acres of cropland, and more than 1,200 acres of cropland.

Approximately 72 percent of all cotton farms, producing about 50 percent of the area's cotton and grain sorghum, were classed in the "under 600 acres" category. Twenty-two percent of all farms were in the "600 to 1,200 acres" category. These farms produced about 33 percent of the area's cotton and 30 percent of the area's grain sorghum. Only 6 percent of all farms contained more than 1,200 acres of cropland.

Based on the 1966 cotton cost survey, the average cotton farm in the 600-1,200-acre size category contained about 935 acres of total land per farm. This size was selected for analysis because the actual cropland in production represents about the largest acreage that can be farmed with one complement of six-row farm machinery.

SERIES STUDY FARMS

The most common enterprise combinations were based in part on farm records compiled for the 1964, 1965, and 1966 cotton cost surveys in the Southern High Plains (3). These data were supplemented by a 1969 survey which provided estimates of 1968 crop acreage, Government cotton program participation, rental arrangements, utilization and cost of farm labor, farm overhead costs, nonfarm income, and estimated January 1 market value of farm property and associated equipment with January 1 debt obligations against each class of asset. The study also utilized data from the 1964 U.S. Census of Agriculture and county data on participation in Government farm programs from the Agricultural Stabilization and Conservation Service.

Major Assumptions

Major assumptions used in developing income estimates for irrigated and nonirrigated cotton farms were: (1) Total farm size and base acreage allotments were constant during 1966-69; (2) average ratios of crop acreages to total cropland and average crop yields did not differ significantly among tenure classes; (3) crop production per acre was based on area average yields, and Government payments per acre were based on county projected yields; (4) all cotton irrigation was by the gravity-flow method; (5) prices received for cotton, grain sorghum and input prices were area average prices; and (6) for rented land, operators received 75 percent of the total Government upland cotton program payment and 67 percent of the corresponding feed grain program payment.

Irrigated Farms

Costs and Returns, 1966-69

The organization, production, and 1966-69 costs and returns for 935-acre irrigated cotton farms are shown in table 5. As the same basic farm organization is used for all three tenure situations, only selected summary items are shown to reflect adjustments of data to the part owner and share-tenant situations. In the tabular analysis, net farm income is defined as the net return to a debt-free farm operator and his family for their unpaid labor, management, and capital. In subsequent analysis

Table 5.--Irrigated 935-acre cotton farms: Organization, yields per acre, costs and returns, full-owner, part-owner, and share-tenant operators, subarea 1, Southern High Plains, 1966-69

Item	Unit	1966	1967	1968	1969
Full owner:					
Land in farm	Acre	935	935	935	935
Cropland harvested	do.	520	512	615	575
Cropland abandoned	do.	88	101	57	79
Cropland diverted for pay	do.	236	124	172	98
Other idle cropland	do.	26	133	26	118
Noncropland	do.	65	65	65	65
Crops harvested:					
Cotton, irrigated	do.	224	201	253	296
Grain sorghum:					
Irrigated	do.	75	89	83	48
Nonirrigated	do.	221	222	279	231
Crop yields per harvested acre:					
Cotton	Pound	480	500	530	390
Grain sorghum:					
Irrigated	Cwt.	40.8	44.2	39.7	39.6
Nonirrigated	do.	11.4	8.9	14.4	12.0
Total farm capital, Jan. 1 1/	Dollar	462,900	455,100	464,900	444,500
Land and buildings	do.	424,900	415,600	424,900	402,500
Machinery and equipment	do.	38,000	39,500	40,000	42,000
Total cash receipts	do.	58,000	62,200	66,300	57,100
Cotton, lint and seed	do.	25,100	26,400	31,600	25,300
Grain sorghum	do.	9,900	10,400	12,400	9,000
Government payments	do.	23,000	25,400	22,300	22,800
Value of perquisites 2/	do.	700	800	800	900
Gross farm income	do.	58,700	63,000	67,100	58,000
Total operating expenses 3/	do.	39,000	40,040	42,440	41,900
Labor	do.	7,040	6,600	6,800	7,080
Seed	do.	1,260	1,930	2,800	1,880
Fertilizer	do.	2,240	2,000	1,820	1,940
Other chemicals	do.	910	970	850	850
Irrigation 4/	do.	7,640	7,560	6,790	7,380
Ginning	do.	4,620	4,320	5,910	5,200
Custom hire	do.	1,200	1,300	1,500	1,070
Power and machinery	do.	10,640	10,930	11,260	11,620
Maintenance of farm buildings	do.	280	280	300	320
Taxes on real estate and personal property	do.	1,740	2,260	2,260	2,260
Insurance	do.	630	1,080	1,350	1,450
Other overhead expense	do.	800	810	800	850
Net farm income (full owner)	do.	19,700	22,960	24,660	16,100
Adjustments from above data for:					
Part owner:					
Acres owned	Acre	300	300	300	300
Acres share-rented	do.	635	635	635	635
Operator's farm capital 1/	Dollar	174,200	172,700	176,200	171,000
Land and buildings	do.	136,200	133,200	136,200	129,000
Machinery and equipment	do.	38,000	39,500	40,000	42,000
Gross farm income	do.	48,100	51,600	54,900	47,500
Operating expenses 3/	do.	35,900	36,710	38,590	38,440
Net farm income	do.	12,200	14,890	16,310	9,060
Share tenants:					
Acres share-rented	Acre	935	935	935	935
Operator's farm capital 1/	Dollar	38,000	39,500	40,000	42,000
Machinery and equipment	do.	38,000	39,500	40,000	42,000
Gross farm income	do.	43,000	46,300	49,200	42,600
Operating expenses 3/	do.	34,000	34,420	36,470	36,040
Net farm income	do.	9,000	11,880	12,730	6,560

1/ The farms as organized exclude livestock enterprises and assume all crops are sold before January 1. 2/ Net rental value of farm dwelling. 3/ Excludes interest paid on borrowed capital. 4/ Irrigation by gravity-flow method. Assumes thickness of underground water-saturated zone to be between 125 and 175 feet and 16-inch irrigation wells 300 feet deep containing 5-inch column pipes that extend 280 feet below surface.

of comparative returns to resources, debt obligations of farm operators are included.

Regardless of tenure class, the total land base per farm was held at 935 acres (960 acres less land in farmstead and right-of-way). Part-owners held title to approximately one-third of their 935-acre operation. This proportion closely approximates the average acreage owned by part owner operators as computed from tabulations of 1966 and 1968 farm survey records.

Because of changes in provisions of the upland cotton program, the cotton acreage harvested on irrigated farms decreased from 224 acres in 1966 to 201 acres in 1967, but then increased to 253 acres in 1968 and 296 acres in 1969. Acreages shown assume that all 1966 and 1967 cotton was planted in patterns of four rows planted and four rows skipped, whereas all 1968 and 1969 cotton was planted without skips.

Total sorghum acreage harvested was 296 acres in 1966, 311 acres in 1967, 362 in 1968, and 279 in 1969. Because cotton acreage increased in 1969, the irrigated portion of the total harvested sorghum crop declined to 48 acres. Total sorghum acreage harvested in 1969 was significantly less than in 1967 and 1968 because of the increase in cotton acreage and increased diversion under the Government feed grain program.

Growing-season conditions differed materially during 1966-69. Yields of cotton lint per irrigated acre averaged 480 pounds in 1966, 500 pounds in 1967, 530 pounds in 1968, and 390 pounds in 1969. Although some cotton acreage was "hailed out," growing-season conditions were exceptionally favorable in 1968. Hail, heavy rains, and early freeze damage contributed to rather heavy abandonment of cotton and grain sorghum acreage in some areas in 1969.

During the 4-year period, gross farm income was highest in 1968 and lowest in 1969. Cash receipts from the sale of cotton lint and seed ranged from 42 percent of gross income in 1967 to 47 percent in 1968. Combined Government program payments ranged from 33 percent of gross farm income in 1968 to 40 percent in 1967.

Seasonal prices for cotton averaged 18.1 cents per pound of lint in 1966, 21.6 cents in 1967, 19.6 cents in 1968, and 18.2 cents in 1969. Sorghum grain prices ranged from $1.69 to $1.93, averaging $1.79 per hundredweight, over the 4-year period.

For each tenure group, total operating expenses were highest in 1968 and lowest in 1966. Expenses associated with ownership and operation of farm machinery (including machinery work hired) constituted about one-third of total farm operating expense. The next largest farm operating expense items were the cost of operating irrigation equipment and hired labor. During 1966-69, combined irrigation and labor expense approximated 30 to 40 percent of total farm operating expense in all three tenure situations. Irrigation expenses were lower in 1968 owing to better rainfall distribution. Ginning expenses differed directly with the quantity of cotton produced.

Net farm income differed largely with growing conditions. It was highest in 1968 and lowest in 1969. Total farm operating expenses in 1969 were similar to 1968 levels; gross farm incomes declined in 1969, due to substantially lower cotton and grain sorghum production. In one

estimate of returns, farm operators were assumed to be debt free (table 5) and no charge was made against their farm capital. Under this assumption, net farm incomes were highest for full owners and lowest for share tenants. However, when farm capital was assumed to earn a return of 6 percent each year (an opportunity cost concept) before computing the residual return to unpaid family labor and management, net farm incomes to the full owner ranged from -$10,570 in 1969 to -$3,230 in 1968. In other words, the full-owner operator earned less than the assumed opportunity cost of 6 percent on farm capital.

Net farm income (adjusted for the capital charge) to the part-owner operator ranged from -$1,200 in 1969 to $5,740 in 1968--providing positive returns to combined labor and management in 1966, 1967, and 1968. Because of relatively low capital use, adjusted net farm income to the share-tenant operator ranged from $4,040 in 1969 to $10,330 in 1968--the largest positive returns to combined unpaid labor and management of the three tenure situations. When a capital charge is included as an expense item, net returns increase as the proportion of land controlled by renting increases.

Nonirrigated Farms

Costs and Returns, 1966-69

The organization, production, and 1966-69 costs and returns for 935-acre nonirrigated cotton farms are shown in table 6.

Operators of nonirrigated cotton farms increased cotton acreages in both 1968 and 1969. The 1969 estimate of 315 acres of cotton harvested on study farms was 23 percent greater than in 1968, 54 percent greater than in 1967, and 40 percent more than in 1966. These estimates assume all cotton was planted in a 4 x 4 skip-row pattern in 1966 and 1967 and a 2 x 2 pattern in 1968 and 1969. Grain sorghum acreage was reduced in 1968 and 1969 because of the change in skip-row rules for cotton. In 1966 and 1967, four-row skips were used to meet diversion requirements, but part of anything less than four-row skips would have been counted against the cotton allotment. Beginning in 1968, however, these less-than-four-row skips did not count against allotments. Therefore, farmers used the more profitable 2 x 2 planting pattern. Consequently, instead of counting four-row skips as diverted feed grain acreage, other land had to be idled to meet diversion requirements for feed grain; the total land area used for cotton remained the same with the 2 x 2 pattern as with the 4 x 4 pattern.

Income, both gross and net, varied widely from year to year, as crop production on nonirrigated farms is highly dependent on favorable weather. Cotton and grain sorghum yields were up in 1966 and 1968, but in 1967 and 1969 the outturn was only mediocre largely because of unfavorable weather. During the 4-year period, gross farm income was highest in 1968 and lowest in 1967. Cash receipts from sales of cotton lint and seed ranged from 41 percent of gross income in 1967 to 66 percent in 1968. Government program payments ranged from 29 percent of gross farm income in 1968 to 43 percent in 1969.

Total operating expenses were significantly lower in 1967 and 1969, due mainly to the lower harvesting costs associated with lower crop production. Because tenant operators incurred fewer costs associated with farm ownership, their farm machinery ownership and operating expenses

Table 6.--Nonirrigated 935-acre cotton farms: Organization, yields per acre, costs and returns, full-owner, part-owner, and share-tenant operators, subarea 2, Southern High Plains, 1966-69

Item	Unit	1966	1967	1968	1969
Full owner:					
Land in farm	Acre	935	935	935	935
Cropland harvested	do.	422	487	340	388
Cropland abandoned	do.	72	103	17	30
Cropland diverted for pay	do.	230	122	154	47
Other idle cropland	do.	136	148	349	395
Noncropland	do.	75	75	75	75
Crops harvested:					
Cotton, nonirrigated	do.	225	204	257	315
Grain sorghum	do.	197	283	83	73
Crop yields per harvested acre:					
Cotton	Pound	515	250	520	275
Grain sorghum	Cwt.	11.4	8.9	14.4	10.2
Total farm capital, Jan. 1 1/	Dollar	197,100	190,100	211,400	208,300
Land and buildings	do.	182,500	175,000	195,600	191,900
Machinery and equipment	do.	14,600	15,100	15,800	16,400
Total cash receipts	do.	44,400	30,300	48,900	35,700
Cotton, lint and seed	do.	26,500	12,800	32,500	18,700
Grain sorghum	do.	4,000	4,400	2,000	1,500
Government payments	do.	13,900	13,100	14,400	15,600
Value of perquisites 2/	do.	700	700	700	800
Gross farm income	do.	45,100	31,000	49,600	36,500
Total operating expenses 3/	do.	22,110	19,520	24,210	20,040
Labor	do.	5,000	5,280	4,680	4,320
Seed	do.	920	1,620	2,250	1,300
Chemicals	do.	780	870	540	430
Ginning	do.	4,980	2,190	5,880	3,920
Custom hire	do.	3,060	1,940	3,070	2,040
Power and machinery	do.	5,650	5,800	5,970	6,170
Maintenance of farm buildings	do.	200	210	220	240
Taxes on real estate and personal property	do.	860	860	860	860
Insurance	do.	290	310	320	340
Other overhead expense	do.	370	440	420	420
Net farm income (full owner)	do.	22,770	11,480	25,390	16,460
Operator adjustments from above data:					
Part owner:					
Acres owned	Acre	318	346	374	374
Acres share-rented	do.	617	583	563	563
Operator's farm capital 1/	Dollar	76,600	79,900	94,000	93,100
Land and buildings	do.	62,000	64,800	78,200	76,700
Machinery and equipment	do.	14,600	15,100	15,800	16,400
Cross farm income	do.	37,400	25,900	42,100	31,000
Operating expenses 3/	do.	20,750	18,640	22,870	18,950
Net farm income	do.	16,650	7,260	19,230	12,050
Share tenants:					
Acres share-rented	Acre	935	935	935	935
Operator's farm capital 1/	Dollar	14,600	15,100	15,800	16,400
Machinery and equipment	do.	14,600	15,100	15,800	16,400
Cross farm income	do.	33,400	22,900	37,000	27,300
Operating expenses 3/	do.	18,410	16,470	20,780	17,040
Net farm income	do.	14,990	6,430	16,220	10,260

1/ Farm organizations exclude livestock enterprises and assume all crops are sold before January 1.
2/ Net rental value of farm dwelling.
3/ Excludes interest paid on borrowed capital.

(including machine work hired) constituted a larger proportion of the total expenses. For the three tenure groups, machinery expense ranged from about 40 to 50 percent of total farm operating expense. Hired labor amounted to about one-fourth of total operating expense in 1966 and 1967, compared with approximately one-fifth of the total in other years. The cost of certified cottonseed was significantly lower in 1969 and the decline in herbicide prices reduced the chemicals expense category. Ginning expenses with the short cotton crops of 1967 and 1969 were approximately two-thirds of the 1966 and 1968 totals.

Net farm incomes were highest in 1968 and lowest in 1967. Although cotton acreage harvested was 23 percent larger in 1969 than in 1968, total lint production was 35 percent smaller due to a 47-percent lower yield per harvested acre. The 1969 grain sorghum yield per acre was 29 percent lower than in 1968.

With no charge for the use of capital, net farm incomes were highest for full owners and lowest for share tenants (table 6). However, again assuming that equity capital based on the current value of farm assets should have earned 6 percent each year, adjusted net farm incomes ranged from $70 to full-owner operators in 1967 to $15,270 to full tenants in 1968. When a capital charge is included as an expense, net returns on nonirrigated farms, like those on irrigated farms, increase as the proportion of rented land increases.

COMPARATIVE RETURNS TO RESOURCES

The question of equivalent returns to agriculture has received considerable attention in legislative action designed to redistribute income, and in research designed to develop appropriate procedures to compare returns from farming with returns to similar resources employed in other occupations and businesses (1, 6). In this analysis, two methods are used to estimate comparable returns. The first method, hereafter referred to as the Stockholder Standard, compares returns to operator equities in depicted farms with returns to similar amounts of capital invested in common stocks. The second method, called the Landlord Standard, similarly compares returns to the same farm equities with net returns earned by a debt-free landlord having an equivalent equity in the same type of farm. Returns are compared with and without adding capital gains (or losses) to the operator's income from farm operations, to stockholder dividends, and to the landlord's net return from his share of the crops.

In both methods, farm operator labor and management inputs are assumed able to earn returns in nonfarm employment equal to the average annual earnings of manufacturing-type workers in Texas as reported by the U.S. Department of Labor (5). Opportunity cost estimates for other unpaid, operator-family, farm-employed labor were computed using a rate of $1.60 per hour times the estimated hours worked on the farm.

Farm operator equities for depicted farms were estimated from data obtained in a 1969 survey. Farm assets and liabilities of part-owner and full-tenant operators of 935-acre irrigated and nonirrigated cotton farms are summarized in tables 7 and 8. Real estate debt is shown as debt per acre of land owned; machinery indebtedness is debt per acre of land operated (table 7). Data for full-owner operators are not shown because in total, within the size group analyzed, they occurred relatively infrequently and therefore were not interviewed.

Table 7.--Number of cotton farmers reporting debt, and amount of debt per acre, by farm type and tenure, subareas 1 and 2, Southern High Plains, 1968 1/

Item	Subarea 1 (irrigated)		Subarea 2 (nonirrigated)	
	Part owners	Full tenants	Part owners	Full tenants
Number of farmers:				
Surveyed	42	38	42	34
Reporting real estate debt	33	---	27	---
Reporting farm machinery debt	20	22	17	15
Real estate debt (dollars): 2/				
Range	5-377	---	6-188	---
Median	96	---	67	---
Average	114	---	74	---
Farm machinery debt (dollars): 3/				
Range	2-15	1-52	1-20	2-14
Median	6	9	3	6
Average	6	13	6	6

1/ Size category of farms: 600-1,200 acres of cropland.
2/ Per acre of land owned.
3/ Per acre of land operated.

Table 8.--Distribution of cotton farmers reporting debt by ratio of total debts to total value of assets, by farm type and tenure, subareas 1 and 2, Southern High Plains, 1968 1/

Debt-asset ratio class	Subarea 1 (irrigated)				Subarea 2 (nonirrigated)			
	Part owners		Full tenants		Part owners		Full tenants	
	Number	Percent of total	Number	Percent of total	Number	Percent of total	Number	Percent of total
0	7	17	16	42	11	26	19	56
.001-.099	11	26	6	16	7	17	2	6
.100-.199	9	21	5	13	9	21	3	9
.200-.299	7	17	4	11	7	17	4	11
.300-.399	3	7	4	11	3	7	5	15
.400-.499	4	10	0	0	2	5	1	3
.500-.599	1	2	2	5	2	5	0	0
.600-.699	0	0	1	2	1	2	0	0
.700-1.000	0	0	0	0	0	0	0	0
Total	42	100	38	100	42	100	34	100
Total indebted	35	-	22	-	31	-	15	-

1/ Size category of farms: 600-1,200 acres of cropland.

Real estate debts of part-owner operators of irrigated farms ranged from $5 to $377 per acre of land owned; however, half of them reported real estate debts ranging between $48 and $141 per acre. Comparable indebtedness on nonirrigated farms ranged from $6 to $188 per acre with half of the reported indebtedness ranging between $40 and $100 per acre owned. Liabilities of irrigated-farm operators averaged well above those of nonirrigated-farm operators, in total, but because of the greater value associated with irrigated land, the average debt load in relation to value of assets was lower on irrigated farms.

Farm machinery debts averaged $6 per acre of cropland on part-owner-operated irrigated and nonirrigated farms. Approximately 60 percent of the irrigated-farm operators and 53 percent of the nonirrigated-farm operators reported machinery indebtedness ranging between $3 and $8 per acre of cropland. Full tenants carried more machinery indebtedness per acre of cropland on irrigated farms than on nonirrigated farms. Regardless of farm type or tenure, the median and average machinery indebtedness was low in relation to real estate indebtedness and to the value of farm physical assets.

Approximately half of all full-tenant operators reported indebtedness; among part owners, 83 percent of the irrigated-farm and 74 percent of the nonirrigated-farm operators reported indebtedness (table 8). Although indebtedness was more common among part-owner operators, the debt-asset ratios averaged lower on such farms than on tenant-operated farms. Among part-owner operators reporting indebtedness, the debt-asset ratio was under 0.3 on 77 percent of the irrigated farms and 74 percent of the nonirrigated farms; on tenant-operated farms it was under 0.3 on 68 percent of the irrigated farms and 60 percent of the nonirrigated farms (table 8).

Procedures in Developing Comparative Returns

Returns to resources in farm and nonfarm uses are developed and compared in tables 9 and 10. Items 1-3 in tables 9 and 10 show the farm operator's equity in farm physical assets. Item 1(b) shows the 1968 land values per acre used to compute the total value of land and buildings. Land values used in computing the rate of capital gain (loss) for items 7 and 19 are shown in the following tabulation:

Land values (January 1) per acre of total land in farms

Year	Irrigated farms	Nonirrigated farms
1964	$477	$212
1965	478	208
1966	454	195
1967	444	187
1968	454	209
1969	430	205

The 1969 land values shown are weighted averages derived from the May 1969 farm survey. Estimates for 1964-68 were derived from unpublished USDA estimates of the average sale price of irrigated and nonirrigated land in the Southern High Plains area in those years. Item 3, total operator equity, is the amount of capital assumed in the Stockholder and Landlord Standards. It is the key item used in computing

Table 9.--Operator equity in farm physical assets, January 1, 1968, and comparative returns to resources under Stockholder and Landlord Standards, 935-acre irrigated and nonirrigated cotton farms, by tenure, Southern High Plains, Texas, 1968

Item	Irrigated farms		Nonirrigated farms	
	Part owner	Share tenant	Part owner	Share tenant
Operator's equity in physical assets (dol.) 1/				
(1) Land and buildings:				
(a) Real estate (acres) 2/	300	0	374	0
(b) Average value per acre 3/	454		209	
(c) Total value	136,200		78,200	
(d) Operator debt 4/	28,800		25,100	
(e) Operator equity	107,400		53,100	
(2) Value of farm machinery and equipment owned	40,000	40,000	15,800	15,800
(a) Machinery and equipment debt 5/	4,800	8,400	6,400	5,600
(b) Operator equity	35,200	31,600	9,400	10,200
(3) Total operator equity	142,600	31,600	62,500	10,200
Comparative returns to resources				
Operator's farm income, 1968 (dol.):				
(4) Operator gross returns	54,900	49,200	42,100	37,000
(5) Operator expenses 6/	41,500	38,400	24,900	21,900
(6) Net returns to operator 7/	13,400	10,800	17,200	15,100
(7) Capital gains, 1964-67 annual rate 8/	-1,650	---	-270	---
(8) Net, including capital gains	11,750	10,800	16,930	15,100
Stockholder Standard (dol.):				
(9) Wages for 1968 9/	6,990	6,990	6,980	7,580
(10) Dividends for 1968 10/	4,560	1,010	2,000	330
(11) Total, excluding capital gains	11,550	8,000	8,980	7,910
(12) Capital gains, 1964-67 annual rate 11/	9,770	2,160	4,280	700
(13) Total, including capital gains	21,320	10,160	13,260	8,610
Comparative resource returns ratio:				
(14) Excluding capital gains (line 6 ÷ line 11)	1.16	1.35	1.92	1.91
(15) Including capital gains (line 8 ÷ line 13)	.55	1.06	1.28	1.75
Landlord Standard (dol.):				
(16) Wages for 1968 9/	6,990	6,990	6,980	7,580
(17) Net land rent (share rent) for 1968 12/	3,980	890	2,880	470
(18) Total, excluding capital gains	10,970	7,880	9,860	8,050
(19) Capital gains, 1964-67 annual rate 8/	-1,710	-380	-220	-40
(20) Total, including capital gains	9,260	7,500	9,640	8,010
Comparative resource returns ratio:				
(21) Excluding capital gains (line 6 ÷ line 18)	1.22	1.37	1.74	1.88
(22) Including capital gains (line 8 ÷ line 20)	1.27	1.44	1.76	1.89

See footnotes on following page.

Footnotes for Table 9 (Comparative Returns for 1968)

1/ These farms do not have livestock enterprises. Crops produced are presumed to be sold before January 1 each year.

2/ Average acres owned by part-owner farm operators in survey within size range of 600-1,200 acres total cropland.

3/ Derived by adjusting May 1969 survey estimates to January 1969 by unpublished USDA estimates of the average value of irrigated and nonirrigated land in the Southern High Plains area.

4/ 5/ Computed for each farm shown as the product of median debt reported per acre of total land owned (part-owners) or operated (full tenants) and the acres in item 1a.

6/ Includes interest paid on farm mortgage for one year and on operating capital for 6 months. No charge is made for equity capital.

7/ Net returns to farm operator and unpaid family labor, to operator management and operator capital.

8/ See text table, page 17, for land values by years. Average annual rates for 1964-67 computed as follows: Irrigating part-owner--$454 ÷ $477 = .9518, 1.0000 - .9518 = .0482, .0482 ÷ 4 = 1.20% average annual loss; nonirrigating part-owner--$209 ÷ $212 = .9858, 1.0000 - .9858 = .0142, .0142 ÷ 4 = .35% average annual loss. Item 7 entries computed applying appropriate loss rate times item 1c, total value of land and buildings. Item 19 entries computed applying same rates times item 3, total operator equity.

9/ The components of these estimates consist of opportunity cost estimates for the farm operator's labor and for unpaid farm labor of his family. The estimate for each farm operator is identical at $6,230, computed by applying the U.S. Department of Labor average weekly earnings of $119.81 for manufacturing workers in Texas times 52 weeks. Opportunity cost estimates for other unpaid farm labor were calculated using a per hour rate of $1.60 (Federal Minimum Wage) times the estimated hours worked on the farm.

10/ See text table, page 22. Computed as product of 3.2% and item 3, total operator equity.

11/ See text table, page 22, for changes in value of stock shares by years. Average annual rate for 1964-67 computed as follows: for irrigated farms $96.11 ÷ $75.43 = 1.2742 or 27.42% gain ÷ 4 years = 6.85%.

12/ Assumes theoretical debt-free reinvestment of total operator equity (item 3) to purchase similar farmland for renting out on crop-share basis to earn a per acre rate of return equal to that earned by landlord in 1968.

Example of computations for irrigating part-owner:

$67,116	Full-owner income	$42,433	Full-owner expense
-49,214	Share-tenant income	-36,472	Share-tenant expense
$17,902	Landlord income	$ 5,961	Landlord expense

$31,521	Full-owner operating capital*	$17,902	
-29,887	Share-tenant operating capital**	-6,043	($5,961 plus $82)
$ 1,634	x 5% = $82 interest	$11,859	Landlord net income on 870 acres of cropland

$11,859 ÷ 870 acres cropland = $13.63 per acre cropland
$142,600 (part-owner equity) ÷ $454 per acre = 314 acres total land
314 x .93 (ratio of cropland to total land) = 292 acres cropland
292 x $13.63 = $3,980 = item 17, net land rent

* Excludes as expenses machinery and equipment depreciation, maintenance of service buildings, and overhead-type expense items, for example, real estate and personal property taxes, insurance, etc.

** Computed as for part owner for items pertinent to share tenant.

Table 10.--Operator equity in farm physical assets, January 1, 1968, and comparative returns to resources under Stockholder and Landlord Standards, 935-acre irrigated and nonirrigated cotton farms, by tenure, Southern High Plains, Texas, average, 1966-68

Item	Irrigated farms		Nonirrigated farms	
	Part owner	Share tenant	Part owner	Share tenant
Operator's equity in physical assets (dol.) 1/:				
(1) Land and buildings:				
(a) Real estate (acres) 2/	300	0	374	0
(b) Average value per acre 3/	454		209	
(c) Total value	136,200		78,200	
(d) Operator debt 4/	28,800		25,100	
(e) Operator equity	107,400		53,100	
(2) Value of farm machinery and equipment owned	40,000	40,000	15,800	15,800
(a) Machinery and equipment debt 5/	4,800	8,400	6,400	5,600
(b) Operator equity	35,200	31,600	9,400	10,200
(3) Total operator equity	142,600	31,600	62,500	10,200
Comparative returns to resources				
Operator's farm income, 1966-68 (dol.):				
(4) Operator gross returns	51,530	46,180	35,120	31,120
(5) Operator expenses 6/	39,770	36,860	22,710	19,640
(6) Net returns to operator 7/	11,760	9,320	12,410	11,480
(7) Capital gains, 1965-67 annual rate 8/	-2,270	0	0	0
(8) Net, including capital gains	9,490	9,320	12,410	11,480
Stockholder Standard (dol.):				
(9) Wages for 1968 9/	6,990	6,990	6,980	7,580
(10) Dividends, 1966-68 annual rate 10/	4,710	1,040	2,060	340
(11) Total, excluding capital gains	11,700	8,030	9,040	7,920
(12) Capital gains, 1966-68 annual rate 11/	6,070	1,340	2,660	430
(13) Total, including capital gains	17,770	9,370	11,700	8,350
Comparative resource returns ratio:				
(14) Excluding capital gains (line 6 ÷ line 11)	1.01	1.16	1.37	1.45
(15) Including capital gains (line 8 ÷ line 13)	.53	.99	1.06	1.37
Landlord Standard (dol.):				
(16) Wages for 1968 9/	6,990	6,990	6,980	7,580
(17) Net land rent (share rent) 1966-68 average 12/	3,790	830	2,350	380
(18) Total, excluding capital gains	10,780	7,820	9,330	7,960
(19) Capital gains, 1965-67 annual rate 8/	-2,380	-530	0	0
(20) Total, including capital gains	8,400	7,290	9,330	7,960
Comparative resource returns ratio:				
(21) Excluding capital gains (line 6 ÷ line 18)	1.09	1.19	1.33	1.44
(22) Including capital gains (line 8 ÷ line 20)	1.13	1.28	1.33	1.44

See footnotes on following page.

Footnotes for Table 10 (Comparative Returns for 1966-68)

Footnotes 1-7 same as for table 9.

8/ See text table, page 17, for land values by years. Average annual rate for 1965-67 computed as follows: Irrigating part owner--$454 ÷ $478 = .95, 1.00 - .95 = .05, .05 ÷ 3 = 1.67% average annual loss; nonirrigating owner renter--$209 ÷ $208 = 1.0048 or essentially no change over 3-year period. Item 7 entries computed by applying loss rate times item 1c, total value of land and buildings. Item 19 entries computed applying same rate times item 3, total operator equity.

9/ Same as 9/ on previous table.

10/ See text table, page 22.
$2.87 + $2.92 + $3.07 = $8.86
$92.18 + $80.38 + $96.11 = $268.67
$8.86 ÷ $268.67 = 3.30% average dividend rate

11/ See text table, page 22, for change in value of stock shares by years. Average annual rates for 1966-68 computed as follows: for irrigated farms $103.93 ÷ $92.18 = 1.1275 or 12.75% gain over 3-year period. Annual average rate = 12.75 ÷ 3 = 4.25%.

12/ Assumes theoretical debt-free reinvestment of total operator equity (item 3) to purchase similar farmland for renting out as a landlord on crop-share basis to earn a per acre rate of return. Entries for this item calculated as in example for previous table except that income and expenses are averaged here for 1966-68.

items 10, 12, 17, and 19 in tables 9 and 10. Operator debt levels are based on the median debt per acre of total land owned or operated by indebted farmers. Total land owned was computed from the individual farm reports of acreage owned.

Items 4-8 present operating results for the farms, with and without capital gains. Operator expenses (item 5) include interest paid for operating capital and on machinery and real estate debt. A charge for the equity capital invested in production resources is not included. The exclusion of such a charge as an expense item provides a basis for comparing the combined returns to operator and unpaid family labor, management, and equity capital with returns from similar amounts invested under the Stockholder and Landlord Standards.

Items 9-13 show the summary information used in preparing the Stockholder Standard. Stockholder Standard items compare resource returns to the farm operator with returns to similar capital invested in a broad portfolio of common stocks and similar labor employed at nonfarm work. The opportunity cost of labor (item 9) has two components: (1) Labor income to the farm operator was based on the average 1968 yearly wage earned by manufacturing workers in Texas (5), and (2) the return to unpaid family labor was computed by multiplying the hours of such labor used on the farm by $1.60, the Federal minimum wage in 1968. This provides a basis for comparing total returns as a stockholder (item 11) with net returns to the farm operator (item 6). Similarly, with capital gains (losses) included, item 13 is compared with item 8. The returns to investments in stocks (items 10 and 12) are based on Standard and Poor Corporation's "500 stock averages" as follows:

Year	Value per share (January 2)	Per share cash dividend	Dividend percentage rate
	(Dollars)	(Dollars)	(Percent)
1964	75.43	2.50	3.31
1965	84.23	2.72	3.23
1966	92.18	2.87	3.11
1967	80.38	2.92	3.63
1968	96.11	3.07	3.20
1969	103.93	N.A.	N.A.

Items 16-20 constitute the Landlord Standard for comparing farm operator net earnings with net rental income received by a debt-free landlord with the same equity and equivalent household labor employed off the farm.

The comparative return ratios, items 14 and 15 for the Stockholder Standard and items 21 and 22 for the Landlord Standard, indicate the relative profitability of farming. A ratio greater than 1.00 reflects relatively higher returns to resources employed in agriculture, whereas a ratio smaller than 1.00 indicates a higher return to resources employed in nonagricultural pursuits.

Returns from Farming and Comparative Returns

Wide variations in farm output and farm income are characteristic of agricultural operations in the Southern High Plains. This is particularly true for nonirrigated farms because production is highly contingent on rainfall. Irrigation does much to stabilize farm output, but irrigated production, like nonirrigated production, is subject to year-to-year variation due to such adverse weather conditions as hail, heavy and untimely rainfall, and high winds.

Under these conditions, farm income in a particular year is not indicative of farm income over a period of years. This is reflected in the tabulations and comparisons shown in tables 9 and 10. The data in table 9 pertain to 1968 (an exceptionally favorable year), whereas those in table 10 incorporate data for 1966, 1967, and 1968. Weather conditions were unfavorable for nonirrigated production in 1967. Thus, farm and nonfarm returns averaged over several years as in table 10 provide a better basis for comparison.

Stockholder Standard Comparison

With capital gains (losses) excluded, net returns to operator resources employed in agriculture exceeded those that were obtainable by investing in a portfolio of common stocks (items 6 and 11, table 10). With capital gains (losses) included, the alternative income prospects differ with type of farming and tenure arrangement. The more heavily capitalized operator of an irrigated farm, particularly the part-owner operator, could have obtained a greater total return as a stockholder with his labor employed at industrial wage rates (items 8 and 13, table 10). Because smaller amounts of capital are involved and returns to capital are higher on nonirrigated than on irrigated farms, inclusion of capital gains (losses) does not change the relative income position of the nonirrigated-farm operator. The nonirrigated-farm operator received a higher total return to his management, labor, and equity capital than could be obtained under the Stockholder Standard (items 8 and 13, table 10).

Landlord Standard Comparison

With or without the inclusion of capital gains (losses), net returns to farm operators were considerably larger than the net return to similar amounts of capital and labor under the Landlord Standard (items 8 and 20, table 10). The relative performance of individual farms and tenure types were consistent with those under the Stockholder Standard.

Stockholder vs. Landlord Standard Comparison

Comparison of the Stockholder and Landlord Standard resource return ratios (items 15 and 22, table 10) indicate the relative returns to similar amounts of resources in these different uses. In comparing returns to a stockholder with possible returns to a landlord, the standard with the lower ratio provides the more remunerative investment alternative. Items 15 and 22, table 10, indicate that the Stockholder Standard provided a more attractive return to resources than the Landlord Standard during 1966-68, irrespective of the type of farming or tenure situation involved.

CONCLUSION

Items 8, 13, and 20 of table 10 indicate that returns to operator resources employed in highly capitalized irrigated farming in the Southern High Plains during 1966-68 were lower than total returns to similar capital invested in a broad portfolio of stocks and similar labor employed at nonfarm work. (Land values declined over the period considered while stock values increased.) In contrast, because of lower capitalization, the returns to part-owner operators of nonirrigated farms were greater than those calculated under the Stockholder or Landlord Standard. The tenant-operator of a nonirrigated farm, with a relatively low equity, is essentially engaged in selling his labor and management. The return, mostly to labor and management, for a tenant-farm operator was substantially greater than the alternative annual wages for nonfarm work (item 6 vs. items 9 and 16, table 10). In summary, the appraisals suggest a low rate of return on capital invested in land, particularly irrigated land, compared with investments in common stocks.

LITERATURE CITED

(1) Duvick, Richard D. and Uhl, Joseph N.
1968. Comparisons of actual farm incomes with parity incomes for Michigan farmers, 1965 and 1966. Mich. State Univ., Agr. Econ. Rpt. No. 113, 24 pp. Oct.

(2) Hughes, W.F. and Harman, Wyatte L.
1969. Projected economic life of water resources, Subdivision Number 1, High Plains Underground Water Reservoir. Texas Agr. Expt. Sta. Tech. Mono. 6, 82 pp., illus. Dec.

(3) Starbird, I.R. and French, B.L.
1969. Costs of producing upland cotton in the United States, 1964. U.S. Dept. Agr., Econ. Res. Serv., 1966 Supp. to Agr. Econ. Rpt. No. 99, 46 pp., illus. Sept.

(4) U.S. Department of Agriculture, Economic Research Service.
1970. Cotton Situation. CS-244, 44 pp., illus. Jan.

(5) U.S. Department of Labor, Bureau of Labor Statistics.
1969. Employment and earnings statistics for States and areas, 1939-68. Bul. No. 1370-6. Aug.

(6) U.S. Senate.
1967. Parity returns position of farmers. Report to the Congress of the United States, 90th Cong., 1st Sess., 62 pp., Doc. No. 44. Aug. 10.

UNITED STATES DEPARTMENT OF AGRICULTURE
WASHINGTON, D. C. 20250

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF
AGRICULTURE